

A neat substriate variety, the striæ springing from the base of each chamber and extending about three-fourths the way to its summit.

28. *Nodosaria (Dentalina) cornicula*, D'Orb. Pl. IX. fig. 56.

"*Orthoceras Corniculum*;" Soldani, Testac. vol. i. pt. 2. p. 98, pl. 105. fig. K. D'Orb. *op. cit.* p. 255. no. 47.

"*Hab.* Fossil, Coroncina." (Mediterranean or Adriatic, *Soldani*.)

This may be accepted as a convenient subvarietal term for a Dentaline *N. raphanus (D. obliqua)*, having a smooth globose primordial segment, larger than those that immediately follow. The later chambers rapidly increase in size; the last, or tenth, is nearly twenty times as long as the second.

29. *Frondicularia alata*, D'Orb. Pl. X. fig. 66.

"*Nautili caudiformes*;" Soldani, Testac. vol. ii. p. 13, pl. 1. fig. C. D'Orb. *op. cit.* p. 256. no. 2.

"*Hab.* The Adriatic." (Fossil near Sienna, *Soldani*.)

A very short wide *Frondicularia*; the lower ends of the chambers irregular and pointed. We doubt the locality given by D'Orbigny for *Frondicularia* in a recent state (see Quart. Journ. Geol. Soc. vol. xvi. p. 300). If *Frondiculariæ* were found by him in the shallow lagoons of the Adriatic, they must have been derived from Tertiary clays. Soldani speaks of this species as common in the fossil state in the clays of San Quirico, Monte Ilco, and the neighbourhood of Sienna.

30. *Frondicularia striata*, D'Orb. Pl. X. fig. 67.

"*Orthoceras Cuspis*;" Soldani, Testac. vol. ii. p. 34, pl. 9. figs. Q, R. D'Orb. *op. cit.* p. 256. no. 3.

"*Hab.* Fossil at Coroncina." (Near Sienna, *Soldani*.)

A striate variety of the normal form of *Frondicularia*. (Fig. R is copied.)

31. *Frondicularia pupa*, D'Orb. Pl. X. fig. 64.

"*Orthoceras Cuspis*;" Soldani, Testac. vol. ii. p. 34, pl. 9. fig. S. D'Orb. *op. cit.* p. 256. no. 4.

"*Hab.* Fossil at Coroncina." (Near Sienna, *Soldani*.)

This appears to be a passage-form between *Frondicularia* and *Lingulina*. Such specimens are not uncommon; and it may be convenient, therefore, to retain the name.

32. *Frondicularia digitata*, D'Orb. Pl. X. fig. 65.

"*Orthoceras Cuspis*;" Soldani, Testac. vol. ii. p. 34, pl. 9. fig. P. D'Orb. *op. cit.* p. 256. no. 6.

"*Hab.* Fossil at Coroncina." (Near Sienna, *Soldani*.)

A long *Frondicularia*, with chambers of nearly even size; the sides almost parallel.

33. *Lingulina carinata*, D'Orb. Pl. IX. fig. 61.

"*Testæ Ouales, oliviformes, pyriformes, fusiformes, &c.*;" Soldani, Testac. vol. ii. p. 37, pl. 12. fig. P. D'Orb. *op. cit.* p. 257. no. 1.

"*Hab.* The Antilles, and, according to Soldani, fossil in the neighbourhood of Sienna."

Noticed previously, in treating of the Models, Ann. N. H. ser. 3. vol. xvi. p. 23.

34. *Lingulina alata*, D'Orb. Pl. IX. fig. 63.

"*Orthoceratia Zoophytica subcordiformia*;" Soldani, Testac. vol. i. pt. 2. p. 94, pl. 99. fig. N. D'Orb. *op. cit.* p. 257. no. 2.

"*Hab.* The Adriatic." (Mediterranean, *Soldani*.)

This is *Lingulina carinata* with the edge extended so as to produce a thin even-margined keel.

35. *Lingulina Soldanii*, D'Orb. Pl. XI. fig. 121.

"*Orthoceras Pupa*;" Soldani, Testac. vol. i. pt. 2. p. 99, pl. 108. figs. E, F. D'Orb. *op. cit.* p. 257. no. 3.

"*Hab.* The Adriatic."

Soldani's figures are obscure; but they are probably intended to represent somewhat unusually short specimens of *Grammostomum pennatula*, Batsch, sp. (= *Vulvulina capreolus*, D'Orb.), with spiral commencement. The entire plate is devoted to varieties of this Textularian genus, mostly with the early segments spirally arranged, and some with a uniserial termination. See also Nos. 59 & 60, further on.

36. *Vaginulina striata*, D'Orb. Pl. IX. fig. 58.

"*Hortoceratia Vaginulam gladii referentia*;" Soldani, Testac. vol. ii. App. p. 141, pl. 6. figs. 44, n, N. D'Orb. *op. cit.* p. 257. no. 3.

"*Hab.* Recent in the Adriatic." (Fossil at Coroncina and Monte Ilco, *Soldani*.)

It is convenient to keep this trivial name for those flat *Vaginulinae* whose surface is traversed from end to end with striæ, as distinct from the biconvex forms, with less regular costæ, comprised under the name *V. linearis* (see 'Monograph

Foram. Crag,' p. 66); nevertheless the distinction cannot be regarded as one of much morphological importance.

37. *Vaginulina marginata*, D'Orb. Pl. IX. fig. 59.

"*Orthoceras, Vaginula* species;" Soldani, Testac. vol. i. pt. 2. p. 97, pl. 103. fig. *M*. D'Orb. *op. cit.* p. 258. no. 7.

"*Hab.* The Adriatic." (Mediterranean, *Soldani*.)

A marginate *Vaginulina*, with peculiar limbate sutures. For a synopsis of the subgenus *Vaginulina*, see our 'Monogr. Foram. Crag,' l. c.

38. *Vaginulina caudata*, D'Orb. Pl. IX. fig. 60.

"*Orthoceratia Vaginula*;" Soldani, Testac. vol. ii. p. 14, pl. 1. figs. *F. G*. D'Orb. *op. cit.* p. 258. no. 8.

"*Hab.* The Adriatic." (Fossil, San Quirico, *Soldani*.)

Our outline is copied from fig. *G*, the other drawing (*F*) being somewhat doubtful and probably representing a smooth *Uvigerina*. The specimen represented is a straight *Vaginuline* *Nodosarian*, with a wide carina on the inner or concave margin, and a long spine projecting from the apex or the earliest chamber. Such forms may frequently be met with both recent and fossil, but seldom with the mucro inserted abruptly on the square end of the test, as given in the figure.

39. *Marginulina raphanus*, Linn. sp. Pl. X. fig. 72.

"*Orthoceratia Raphanus, Raphanistrum, & Rapistrum*;" Soldani, Testac. vol. i. pt. 2. p. 91, pl. 94. figs. *N, P, Q, R, X, Y*. D'Orb. *op. cit.* p. 258. no. 1.

"*Hab.* Recent in the Adriatic; fossil at Castel-Arquato, Italy." (Mediterranean and Adriatic, *Soldani*.)

Noticed in our review of the Models; see also our Monograph of the Crag Foraminifera, and other papers.

Amongst Soldani's figures above quoted, fig. *N* represents the true *Nodosaria raphanus*, and fig. *R* is *N. obliqua*; but plenty of intermediate grades are known to connect these with the *Marginuline* individuals.

40. *Marginulina hirsuta*, D'Orb. Pl. XI. fig. 125.

"*Orthoceratia Villosa seu rudia*;" Soldani, Testac. vol. i. pt. 2. p. 96, pl. 101. figs. *ll-oo*. D'Orb. *op. cit.* p. 259. no. 5.

"*Hab.* The Adriatic." (Mediterranean, and fossil at San Quirico, *Soldani*.)

We are not disposed to regard Soldani's figures, taking them all together, as referable to the *Nodosarinæ* at all. They appear to us somewhat unusually rugose examples of the

Textularian subgenus *Bigenerina* (such as *B. digitata* and *B. nodosaria*), running into Clavuline forms, with too little distinctive character to need a separate varietal name.

Fig. *mm* is non-segmented, but has an abnormal lateral chamber; fig. *oo* has one constriction; fig. *nn* shows three; fig. *ll* seven; and all are possibly *Lituolæ*. Some similar forms are represented on the succeeding plate 102, together with other rugose Nodosarine forms. Taking them all together, we may say that Soldani had here mingled rough dimorphous *Textulariæ* with some straight *Lituolæ*, and at least one spinous *Nodosaria*.

41. *Marginulina carinata*, D'Orb. Pl. IX. fig. 62.

"*Orthoceratia Zoophytica elongata*;" Soldani, Testac. vol. i. pt. 2. p. 92, pl. 97. figs. *hh*, *mm*. D'Orb. *op. cit.* p. 259. no. 8.

"*Hab.* Fossil at Coroncina." (Mediterranean*, *Soldani*.)

Of the two figures referred to we have copied only one (*mm*); for, though the arrangement of chambers is very similar in the other, the term "*carinata*" could not with any fitness be applied to it. In Mr. Parker's collection are some fine specimens of this form, taken off Sicily, which far better help an understanding of its peculiarities than the figures. The earlier chambers are coiled in a subglobular manner, embracing, and to a great extent hiding, one another; then follow a number which are merely curved; and the shell is terminated by a straight linear series, with all of the segments more or less flattened and showing a tendency to expand backwards on either edge. The concave side of the shell has a carina extending in a curved line from the centre of the first chamber to the wide portion of the terminal one.

Possibly it may be best to regard this as a dimorphous variety of *Lingulina carinata*, though it might with equal reason be assigned to the genus *Flabellina*.

42. *Marginulina sublituus*, D'Orb. Pl. X. fig. 73.

"*Orthoceras Sublituus*;" Soldani, Testac. vol. i. pt. 2. p. 98, pl. 104. figs. *F*, *G*. D'Orb. *op. cit.* p. 259. no. 9.

"*Hab.* The Adriatic." (Mediterranean or Adriatic, *Soldani*.)

These are modifications of the typical *M. raphanus*; fig. *F* (copied) has the earlier chambers somewhat flattened and smooth.

* These and many other recent Foraminifera of the Mediterranean, off the Tuscan shore and neighbouring islands, Soldani obtained one by one, on breaking up the hard calcareous concretions of zoophytes and lithophytes, including white and red corals.

43. *Marginulina lævigata*, D'Orb. Pl. X. fig. 68.

"*Orthoceratia Lituitata*;" Soldani, Testac. vol. i. pt. 2. p. 95, pl. 100. figs. *bb*, *cc*. D'Orb. *op. cit.* p. 259. no. 10.

"*Hab.* The Adriatic." (Mediterranean and Adriatic, *Soldani**.)

Soldani's figure *bb* is a large and much curved *Dentalina communis* (or narrow *Marginulina lituus*); fig. *cc*, which we have copied, only differs from *Marginulina lituus* in degree of curvature and in a partial carina on the concave margin of the earlier chambers.

44. *Marginulina lituus*, D'Orb. Pl. X. fig. 70.

"*Orthoceras Serrula*;" Soldani, Testac. vol. i. pt. 2. p. 99, pl. 106. figs. *aa*, *bb*. D'Orb. *op. cit.* p. 259. no. 11.

"*Hab.* The Adriatic." (Mediterranean or Adriatic, *Soldani*.)

A useful species, embracing the smooth, much-curved, Marginuline *Nodosariæ* that have many very oblique chambers. Soldani and D'Orbigny notice it as a recent form; but it is not uncommon as a fossil from the Liassic age onwards.

45. *Marginulina lobata*, D'Orb. Pl. X. fig. 71.

"*Polymorpha Subovalia*;" Soldani, Testac. vol. i. pt. 2. p. 115, pl. 117. fig. *p*. D'Orb. *op. cit.* p. 259. no. 12.

"*Hab.* The Adriatic." (Mediterranean, *Soldani*.)

A short, thick-set, few-chambered *Marginulina*, with a partial carina on the concave edge, and strongly limbate sutures.

46. *Marginulina consecuta*, D'Orb. Pl. X. fig. 69.

"*Nuclei in thalamis Orthoceratorum nati*;" Soldani, Testac. vol. i. p. 51, pl. 17. figs. *R*, *S*. D'Orb. *op. cit.* p. 259. no. 13.

"*Hab.* Fossil at Coroncina." (Borro Cieco, *Soldani*.)

We see no reason to doubt Soldani's statement that these, and several other specimens figured in his fourth volume, are casts (obtained by the use of acid in some cases), and not perfect fossils. On any other supposition it would be difficult to understand the drawings he refers to. These are casts of straight *Marginulinæ*.

* Figs. *bb*, *cc*, with other *Nodosariæ*, are described by Soldani as having been obtained from the sea-mud of the Port Ferrajo (Elba) and at the Island Giglio, from the zoophytic concretions (Tuscan Sea), and from the shore at Rimini (Adriatic); but rare at the last place.

47. *Planularia auris*, Defr. Pl. X. fig. 74.

"*Orthoceras Auris*;" Soldani, Testac. vol. i. pt. 2. p. 98, pl. 104. fig. A.
D'Orb. *op. cit.* p. 260. no. 6.

"*Hab.* Var. α . Recent in the Adriatic; fossil at Castel-Arquato. Var. β . Recent in the Mediterranean."

This is the *Planularia auris* of DeFrance. See Ann. Nat. Hist. ser. 3. vol. xii. p. 215. no. 107.

48. *Planularia crepidula*, Fichtel & Moll., sp.
Pl. X. fig. 77.

"*Nautili Lituitati*;" Soldani, Testac. vol. i. pt. 1. p. 64, pl. 58. fig. *bb*.
D'Orb. *op. cit.* p. 260. no. 6.

"*Hab.* The Antilles, and, according to Fischer, the Gulf of Tuscany." (Fossil near Sienna, *Soldani*.)

[*Note.* One of the many misprints in the 'Tableau Méth. de Céphalopodes' occurs in the reference to this species. "Fig. 66" is given in D'Orbigny's text; but this, we think, can only be intended for *bb*. At p. 292. no. 11, figs. *aa, bb, cc* of this plate (all allies of *C. crepidula*) are referred to all together as *Cristellaria elongata*.]

In Ann. Nat. Hist. ser. 3. vol. v. pp. 114 & 115, Fichtel and Moll's "*Nautilus crepidula*" is defined as "a delicate, elongate, Marginuline, flattened *Cristellaria*," "which by innumerable linkings, passes into *C. calcar*," and "runs insensibly into *C. cassis* on one hand, and on the other into the Planularian section of the *Vaginulinæ*." Soldani's fig. *bb* and his fig. *aa* (D'Orbigny's *Cristellaria elongata*, no. 127) are there referred to as attenuate *Cristellariæ* similar to *C. crepidula*, F. & M. sp., but keeled. Fig. *dd*, one of the subcostate Planularian forms, has no keel, and so far satisfies the strict requirements of subvarietal collocation; but the keeled forms are no less closely related. (See succeeding note on No. 49.) We are inclined to regard them all as *C. crepidula*; and if the keeled forms are to be indicated by a name, D'Orbigny's "*Cr. elongata*"* well serves the turn, having the same relation to *C. cultrata* that *C. crepidula* has to *C. rotulata*. Soldani, Testac. vol. ii. Appendix, p. 146, pl. 18. figs. 91, *r, R*, represent a fine *C. crepidula* from San Quirico.

49. *Planularia rostrata*, D'Orb. Pl. X. fig. 75.

"*Nautili Lituitati Cuspides*;" Soldani, Testac. vol. i. pt. 1. p. 64, pl. 58. fig. *dd*. D'Orb. *op. cit.* p. 260. no. 7.

"*Hab.* Fossil at Coroncina." (Near Sienna, *Soldani*.)

* The same as D'Orbigny's *Cristellaria lanceolata*, For. Foss. Vien. p. 89, pl. 3. figs. 41, 42.

An elegant, narrow Planularian *Cristellaria* (figs. *cc* and *dd* are subcostate) with attenuate, almost mucronate, extremities. (D'Orbigny's reference is to pl. 68—evidently an error.)

Figs. *cc* & *dd* have elongate riblets on the lower (earlier) part of the shell, better shown in pl. 59. fig. *ppp*, in vol. i. The series under notice, figs. *aa-dd*, are dimorphous varieties, showing the transition from relatively broad-chambered *Planulariæ* to those with extremely narrow, elongate, and subparallel chambers, and having their original Cristellarian growth more and more definitely succeeded by subsequent chambers set on at a considerable angle, as on either side of a *Flabellina*.

50. *Bigenerina lævigata*, D'Orb. Pl. XI. fig. 124.

"*Orthoceratia Baculi*;" Soldani, Testac. vol. i. pt. 2. p. 96, pl. 103. fig. *D*.
D'Orb. *op. cit.* p. 261. no. 3.

"*Hab.* The Adriatic."

This may be accepted as the Nodosarian form of *Textularia gibbosa*; that is to say, it is a short stout variety of *Bigenerina* with somewhat irregular inflated chambers.

51. *Textularia obtusa*, D'Orb. Pl. XI. fig. 115.

"*Polymorpha Pineiformia*;" Soldani, Testac. vol. i. pt. 2. p. 118, pl. 127.
fig. *H*. D'Orb. *op. cit.* p. 262. no. 1.

"*Hab.* The Adriatic." (With a variety of other Foraminifera: a few from the Adriatic, many from the Mediterranean, and some fossil from near Sienna, *Soldani*.) See note on *Textularia gibbosa*, no. 54.

52. *Textularia lævigata*, D'Orb. Pl. XI. fig. 116.

"*Polymorpha Janiformia*;" Soldani, Testac. vol. i. pt. 2. p. 119, pl. 132.
figs. *L*, *M*? D'Orb. *op. cit.* p. 262. no. 4.

"*Hab.* The Adriatic." (Mediterranean[?], *Soldani*.)

See note on *Textularia gibbosa*, No. 54. Fig. *L* has eight chambers: fig. *M* is smaller and younger, with only four chambers; but it is apiculate.

53. *Textularia punctulata*, D'Orb. Pl. XI. fig. 117.

"*Nautili amphorarii vel janiformes*;" Soldani, Testac. vol. ii. Appendix,
p. 141, pl. 7. figs. 46, *e*, *E*. D'Orb. *op. cit.* p. 262. no. 4.

"*Hab.* The Adriatic."

See note on *Textularia gibbosa*, No. 54. D'Orbigny regards this figure as "*vue en devant*;" but it is really a minute and young shell seen edgewise, and showing only the edge of the first chamber and the aperture of the second.

54. *Textularia gibbosa*, D'Orb. Pl. XI. fig. 118.

"Polymorpha *Janiformia*;" Soldani, Testac. vol. i. pt. 2. p. 119, pl. 132. figs. I, K. D'Orb. *op. cit.* p. 262. no. 6.

"*Hab.* Recent in the Adriatic; fossil at Castel-Arquato." (Mediterranean [?], *Soldani*.)

These also are broadly ovate edge-views of two young shells, one apiculate and the other bluntly angular at the apex. The four *Textulariæ* above enumerated may, so far as we can gather from Soldani's figures, be taken as belonging to the same group, of which *T. gibbosa* (as we know it from the Models) is the best central representative. The figures of *T. gibbosa* selected by D'Orbigny give us little or no assistance in the determination of the characters of the species; but in D'Orbigny's Model no. 28 we have the deficiency supplied. (See Ann. Nat. Hist. ser. 3. vol. xvi. p. 23, pl. 2. fig. 60.) The figure alluded to as *T. obtusa* (No. 51) shows more inflated chambers and a proportionally longer and more parallel-sided shell than in *T. lævigata* (No. 52). There is nothing in Soldani's figure named by D'Orbigny *T. punctulata* (no. 53) to found a species upon. Of these four names we propose only to accept one; and we prefer *Textularia gibbosa*, not only because the Model no. 28 seems the most trustworthy basis, but because it also presents the peculiarities developed to their full extent.

55. *Textularia sagittula*, Defrance. Pl. XI. fig. 114.

"Polymorpha *Sagittulæ*;" Soldani, Testac. vol. i. pt. 2. p. 120, pl. 133. fig. T. D'Orb. *op. cit.* p. 263. no. 20.

"*Hab.* Living on the shores of the Mediterranean; fossil at Castel-Arquato." (Mediterranean or Adriatic, *Soldani*.)

A good subtype; but Soldani's figure of a minute specimen is rough and inaccurate, as was frequently the case when the objects were too small for his artist's microscopical apparatus. This species is noticed in the paper on the species enumerated by De Blainville and Defrance (Ann. Nat. Hist. ser. 3. vol. xii. pp. 217, 218).

56. *Textularia echinata*, D'Orb. Pl. XI. fig. 126.

"Polymorpha *Pineiformia*;" Soldani, Testac. vol. i. pt. 2. p. 118, pl. 127. fig. K. D'Orb. *op. cit.* p. 263. no. 24.

"*Hab.* The Adriatic." (Mediterranean or Adriatic, *Soldani*.)

Soldani's drawing seems rather to be intended for *Bulimina aculeata*, D'Orb.; and an adjoining figure (*I*) on the same plate confirms this view.